In The United States Patent And Trademark Office
Before The Board Of Patent Appeals And Interferences

In re Appln. Of:	BELLO	)
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Serial Number:	10/656,993	)
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Filed:	September 9, 2003	)
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For:	APPARATUS AND METHOD TO WRITE INFORMATION...	)
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Group:	2152	)
		)
Confirmation No.:	9348	)
		)
		)
Examiner:	WHIPPLE, BRIAN P. DOCKET NO.: TUC920030089US1	)

Board of Patent Appeals and Interference
US Patent and Trademark Office
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

Appellants' Brief On Appeal

This Brief is being filed in support of Appellants' Appeal from the Primary Examiner to the Board of Patent Appeals and Interferences. Appellants' are filing on even date herewith a Petition For A One Month Extension. In the event there are any fee deficiencies or additional fees are payable, please charge them, or credit an overpayment, to our Deposit Account No. 170055.

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REAL PARTIES IN INTEREST

The real party in interest in this appeal is International Business Machines Corporation, a New York corporation.

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RELATED APPEALS AND INTERFERENCES

To the best of the knowledge of the undersigned attorney and the Appellants, no other appeals or interferences exist which will affect or be directly affected, or have a bearing on, the instant appeal.

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STATUS OF CLAIMS

1-4, 6-13, and 19-21 stand rejected and are on appeal. Claims 5, and 14-18, have been canceled. The claims on appeal are set forth in **CLAIMS APPENDIX A**.

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STATUS OF THE AMENDMENTS

An Office Action comprising a final rejection of all pending claims was mailed on September 22, 2008. An amendment under Rule 116 was filed on February 23, 2009, to cure certain objections to independent claims 1, 9, and 19, and to cancel claims 14-18.

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SUMMARY OF THE CLAIMED SUBJECT MATTER

Claim 1 recites a method to write information to two virtual tape servers. Support can be found in the Specification on Page 2 at Lines 8-9.

Claim 1 further recites a data storage and retrieval system comprising a host computer, a first virtual tape controller ("VTC") comprising a VTC Copy Queue, a second virtual tape controller, a first virtual tape server ("VTS"), and a second virtual tape server. Support can be found in the Specification on Page 4 at Lines 5-7, and on FIGs. 1A, 1B, and 1C at elements 120 (first virtual tape controller), 125 (second virtual tape controller), 130 (first virtual tape server), and 140 (second virtual tape server), and on FIG. 1C at element 124 (VTC Copy Queue).

Claim 1 further recites said first virtual tape controller comprises a first virtual host device and a first virtual copy device. Support can be found in the Specification on Page 6 at Lines 3-4 and Lines8-9, on FIG. 1A at element 121 (virtual host device) and element 123 (virtual copy device).

Claim 1 further recites said second virtual tape controller comprises a second virtual host device and a second virtual copy device. Support can be found in the Specification on Page 5 at Lines 11-14, on Page 6 at Lines 8-9, and on FIG. 1A at elements 126 (virtual host device) and 128 (virtual copy device).

Claim 1 further recites said first virtual tape server comprises a third virtual host device and a third virtual copy device. Support can be found in the Specification on Page 7 at Lines 1-3 and on FIG. 1A at elements 131 (virtual host device) and 133 (virtual copy device).

Claim 1 further recites said second virtual tape server comprises a fourth virtual host device and a fourth virtual copy device. Support can be found in the Specification on Page 7 at

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Lines 7-10 and Lines 16-20 and on FIG. 1A at element 141 (virtual host device) 143 (virtual copy device).

Claim 1 further recites that a host computer communicates with a first virtual tape server using a host / VTS bandwidth. Support can be found in the Specification on Page 6 at Lines 14-19.

Claim 1 further recites said host computer communicates with said second virtual tape server via said second virtual host device and said fourth virtual host device. Support can be found in the Specification on Page 7 at Lines 7-10.

Claim 1 further recites that a first virtual tape server communicates with a second virtual tape server via said using a VTS / VTS bandwidth. Support can be found in the Specification on Page 6 at Lines 19-20.

Claim 1 further recites writing a host computer file to said second virtual host device disposed in said first virtual tape server. Support can be found in the Specification on Page 12 at Lines 17-20 and in FIG. 4 at step 430.

Claim 1 further recites queuing a copy job in the VTC Copy Queue, wherein that copy job comprises copying a host computer file to the second virtual tape server. Support can be found in the Specification on Page 3 at Lines 3-4 and on Page 11 at Lines 5-6, Page 13 at Lines 3-9, and in FIG. 4 at step 440.

Claim 1 further recites determining an age of said queued copy job. Support can be found in the Specification on Page 3 at Lines 4-5 and on Page 18 at Lines 8-11.

Claim 1 further recites setting an age threshold. Support can be found in the Specification on Page 3 at Line 5 and on Page 17 at Lines 5-7 and in FIG. 6 at step 620.

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Claim 1 further recites determining if the age of said queued copy job is greater than said age threshold. Support can be found in the Specification on Page 3 at Lines 5-6 and on Page 18 at Lines 8-11.

Claim 1 further recites that if an age of a queued copy job is greater than an age threshold, decreasing the host / VTS bandwidth thereby increasing the VTS / VTS bandwidth. Support can be found in the Specification on Page 3 at Lines 6-9 and on Page 6 at Line 21 through Page 7 at Line 6, Page 18 at Line 15 through Page 19 at Line 3, and in FIG. 6 at steps 670 and 680.

Claim 9 recites a first virtual tape server ("VTS") comprising one or more virtual devices having an adjustable aggregate bandwidth. Support can be found in the Specification on Page 2 at Lines 19-20.

Claim 9 further recites a computer readable medium having computer readable program code disposed therein to write information to two virtual tape servers. Support can be found in the Specification on Page 19 at Lines 15-19 and on FIG. 1A at element 185.

Claim 9 further recites a data storage and retrieval system comprising a host computer, a first virtual tape controller ("VTC") comprising a VTC Copy Queue, a second virtual tape controller, a first virtual tape server ("VTS"), and a second virtual tape server. Support can be found in the Specification on Page 4 at Lines 5-7, and on FIGs. 1A, 1B, and 1C at elements 120 (first virtual tape controller), 125 (second virtual tape controller), 130 (first virtual tape server), and 140 (second virtual tape server), and on FIG. 1C at element 124 (VTC Copy Queue).

Claim 9 further recites said first virtual tape controller comprises a first virtual host device and a first virtual copy device. Support can be found in the Specification on Page 6 at

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Lines 3-4 and Lines8-9, on FIG. 1A at element 121 (virtual host device) and element 123 (virtual copy device).

Claim 9 further recites said second virtual tape controller comprises a second virtual host device and a second virtual copy device. Support can be found in the Specification on Page 5 at Lines 11-14, on Page 6 at Lines 8-9, and on FIG. 1A at elements 126 (virtual host device) and 128 (virtual copy device).

Claim 9 further recites said first virtual tape server comprises a third virtual host device and a third virtual copy device. Support can be found in the Specification on Page 7 at Lines 1-3 and on FIG. 1A at elements 131 (virtual host device) and 133 (virtual copy device).

Claim 9 further recites said second virtual tape server comprises a fourth virtual host device and a fourth virtual copy device. Support can be found in the Specification on Page 7 at Lines 7-10 and Lines 16-20 and on FIG. 1A at element 141 (virtual host device) 143 (virtual copy device).

Claim 9 further recites that a host computer communicates with a first virtual tape server using a host / VTS bandwidth. Support can be found in the Specification on Page 6 at Lines 14-19.

Claim 9 further recites said host computer communicates with said second virtual tape server via said second virtual host device and said fourth virtual host device. Support can be found in the Specification on Page 7 at Lines 7-10.

Claim 9 further recites that a first virtual tape server communicates with a second virtual tape server via said using a VTS / VTS bandwidth. Support can be found in the Specification on Page 6 at Lines 19-20.

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Claim 9 further recites receiving a host computer file via said second virtual host device. Support can be found in the Specification on Page 12 at Lines 17-20 and in FIG. 4 at step 430.

Claim 9 further recites receiving a signal from a first virtual tape controller comprising queuing an age of said queued copy job in the first virtual tape controller, wherein that copy job comprises copying a host computer file to the second virtual tape server. Support can be found in the Specification on Page 3 at Lines 3-4 and on Page 11 at Lines 5-6, Page 13 at Lines 3-9, Page 18 at Lines 8-11, and in FIG. 4 at step 440.

Claim 9 further recites that if an age of a queued copy job is greater than an age threshold, decreasing the host / VTS bandwidth thereby increasing the VTS / VTS bandwidth. Support can be found in the Specification on Page 3 at Lines 6-9 and on Page 6 at Line 21 through Page 7 at Line 6, Page 18 at Line 15 through Page 19 at Line 3, and in FIG. 6 at steps 670 and 680.

Claim 19 recites a data storage and retrieval system comprising a host computer, a first virtual tape controller ("VTC") comprising a VTC Copy Queue, a second virtual tape controller, a first virtual tape server ("VTS"), and a second virtual tape server. Support can be found in the Specification on Page 4 at Lines 5-7, and on FIGs. 1A, 1B, and 1C at elements 120 (first virtual tape controller), 125 (second virtual tape controller), 130 (first virtual tape server), and 140 (second virtual tape server), and on FIG. 1C at element 124 (VTC Copy Queue).

Claim 19 further recites said first virtual tape controller comprises a first virtual host device and a first virtual copy device. Support can be found in the Specification on Page 6 at Lines 3-4 and Lines8-9, on FIG. 1A at element 121 (virtual host device) and element 123

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(virtual copy device).

Claim 19 further recites said second virtual tape controller comprises a second virtual host device and a second virtual copy device. Support can be found in the Specification on Page 5 at Lines 11-14, on Page 6 at Lines 8-9, and on FIG. 1A at elements 126 (virtual host device) and 128 (virtual copy device).

Claim 19 further recites said first virtual tape server comprises a third virtual host device and a third virtual copy device. Support can be found in the Specification on Page 7 at Lines 1-3 and on FIG. 1A at elements 131 (virtual host device) and 133 (virtual copy device).

Claim 19 further recites said second virtual tape server comprises a fourth virtual host device and a fourth virtual copy device. Support can be found in the Specification on Page 7 at Lines 7-10 and Lines 16-20 and on FIG. 1A at element 141 (virtual host device) 143 (virtual copy device).

Claim 19 further recites that a host computer communicates with a first virtual tape server using a host / VTS bandwidth. Support can be found in the Specification on Page 6 at Lines 14-19.

Claim 19 further recites said host computer communicates with said second virtual tape server via said second virtual host device and said fourth virtual host device. Support can be found in the Specification on Page 7 at Lines 7-10.

Claim 19 further recites that a first virtual tape server communicates with a second virtual tape server via said using a VTS / VTS bandwidth. Support can be found in the Specification on Page 6 at Lines 19-20.

Claim 19 further recites receiving a host computer file via said second virtual host

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device. Support can be found in the Specification on Page 12 at Lines 17-20 and in FIG. 4 at step 430.

Claim 19 further recites receiving a signal from a first virtual tape controller comprising queuing an age of said queued copy job in the first virtual tape controller, wherein that copy job comprises copying a host computer file to the second virtual tape server. Support can be found in the Specification on Page 3 at Lines 3-4 and on Page 11 at Lines 5-6, Page 13 at Lines 3-9, Page 18 1at Lines 8-11, and in FIG. 4 at step 440.

Claim 19 further recites setting an age threshold. Support can be found in the Specification on Page 3 at Line 5 and on Page 17 at Lines 5-7 and in FIG. 6 at step 620.

Claim 19 further recites determining if the age of said queued copy job is greater than said age threshold. Support can be found in the Specification on Page 3 at Lines 5-6 and on Page 18 at Lines 8-11.

Claim 19 further recites that if an age of a queued copy job is greater than an age threshold, decreasing the host / VTS bandwidth thereby increasing the VTS / VTS bandwidth. Support can be found in the Specification on Page 3 at Lines 6-9 and on Page 6 at Line 21 through Page 7 at Line 6, Page 18 at Line 15 through Page 19 at Line 3, and in FIG. 6 at steps 670 and 680.

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GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The issues presented on appeal are:

1.   Whether claims 1-13 and 19-21 are unpatentable under 35 U.S.C. § 103(a) over Lisiecki et al. (U.S. Pub. No. 2002/0147774) in view of Ravi et al. (U.S. Pat. No. 6,292,834), and in further view of Pittelkow et al. (U.S. Pat. No. 7,043,663).

I.   **THE EXAMINER IMPROPERLY REJECTS CLAIMS 1-21 UNDER 35 U.S.C. §
103(A) AS BEING UNPATENTABLE OVER LISIECKI ET AL. IN VIEW OF
RAVI ET AL., AND IN FURTHER VIEW OF PITTELKOW ET AL.**

   *A.   The Combined Teachings Of Lisiecki et al, Ravi et al., and Pittelkow et al.
   Fail To Teach Or Suggest All The Elements Of Appellants' Claims 1, 9, and
   21*

   Neither Lisiecki et al., nor Ravi et al., nor Pittelkow et al., singly or in combination,

teach writing a host computer file to the first virtual tape server, and queuing a copy of that host

computer file in the VTC Copy Queue, where that copy job comprises copying the host

computer file to the second virtual tape server, as recited in claims 1, 9, and 21.

   Neither Lisiecki et al., nor Ravi et al., nor Pittelkow et al., singly or in combination,

teach decreasing the host / VTS bandwidth thereby increasing the VTS / VTS bandwidth if the

age of the queued copy job is greater than an age threshold, as recited in claims 1, 9, and 21.

The Examiner incorrectly attempts to read the Appellants' invention and disclosure onto the

teachings of Ravi. Appellants respectfully disagree that Ravi anywhere teaches, specifically or

inherently, that reducing a host / VTS bandwidth necessarily increases a VTS / VTS bandwidth.

   Ravi teaches a method for "efficient transmission of multimedia streams from a server

to a client computer over a diverse computer network including local area networks (LANs)

and wide area networks (WANs) such as the internet." Col. 3 at Lines 1-4. Ravi further

teaches that "the client computer includes a playout buffer, and the transmission rate is

dynamically matched to the available bandwidth capacity of the network connection between

the server and the client computer." Col. 3 at Lines 10-14. Ravi further teaches that in no

event can the playout buffer be allowed to overflow, because data packets will then be lost. "If

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the selected bandwidth is higher than the average client computation rate, buffer 366 will eventually overflow and data packets will have to be discarded. " Col. 11 at Lines 27-29.

Neither Lisiecki et al., nor Ravi et al., nor Pittelkow et al., singly or in combination, teach a data storage and retrieval system comprising a host computer, a first virtual tape controller comprising a VTC Copy Queue, a first virtual tape server, and a second virtual tape server, wherein the host computer communicates with the first virtual tape server using a host / VTS bandwidth, and wherein the first virtual tape server communicates with the second virtual tape server using a VTS / VTS bandwidth. This being the case, neither Lisiecki et al., nor Ravi et al., nor Pittelkow et al., singly or in combination, teach decreasing a host / VTS bandwidth in order to increase a VTS / VTS bandwidth, as recited in Appellants' claims 1, 9 and 19.

Appellants' Specification teaches, in pertinent part, that Appellants' virtual tape server comprises a bandwidth, wherein that bandwidth "is shared by all the virtual devices on the VTS. Reducing the bandwidth allocated to one or more of virtual host devices 131, 132, 134, and/or 135, necessarily makes additional bandwidth available for copy devices 133 and/or 135. Increasing the bandwidth allocated to copy devices 133 and/or 136 increases the VTS / VTS bandwidth. Increasing the VTS / VTS bandwidth increases the rate at which files can be copied from VTS 130 to VTS 140 and vice versa." Specification on Page 7 at Lines 1-6.

In order to cure the deficiencies of Lisiecki et al., Ravi et al., and Pittelkow et al., the Examiner erroneously posits that Ravi's method inherently teaches throttling a first bandwidth in order to increase a second bandwidth. As a preliminary matter, the Examiner's thesis fails because neither Lisiecki et al., nor Ravi et al., nor Pittelkow et al., teach use of two adjustable bandwidths. Moreover, the Examiner's inherency argument is fatally flawed.

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It is well-settled that "[i]nherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." *Smithkline Beecham Corp. v. Apotex Corp.* 403 F.3d 1328, 1330 (Fed.Cir. 2005), citing *Continental Can Company USA v. Monsanto Company*, 948 F.2d 1264, 1269 (Fed.Cir. 1991).

In *KSR International Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 167 L. Ed. 2d 705 (2007), the Supreme Court held that the obviousness analysis of *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 86 S. Ct. 684, 15 L. Ed. 2d 545 (1966), controls an obviousness inquiry. The *Graham* obviousness factors include "the scope and content of the prior art" and the "differences between the prior art and the claims". *KSR*, 127 S. Ct. at 1734 (quoting *Graham*, 383 U.S. at 17-18). No combination of Lisiecki et al., Ravi et al., and/or Pittelkow et al., expressly or inherently teach all the elements of Appellants' claims 1, 9, and 21. This being the case, Appellants respectfully submit that claims 1, 9, and 21, are patentable over the combined teachings of Lisiecki et al., Ravi et al., and Pittelkow et al.

B. ***The Combined Teachings Of Lisiecki et al., Ravi et al., and Pittelkow et al. Fail To Teach Or Suggest All The Elements Of Appellants' Claims 2 and 6-8***

Claims 2 and 6-8 depend from claim 1. Under 35 U.S.C. § 112, fourth paragraph, "a claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers." "If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious." MPEP 2143.03; *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed.Cir. 1988). Because claim 1 is patentable over the teachings of Lisiecki et al., Ravi et al., and Pittelkow et al., Appellants respectfully submit that claims 2 and 6-8 are

also patentable over the teachings of Lisiecki et al., Ravi et al., and Pittelkow et al.

C. The Combined Teachings Of Lisiecki et al, Ravi et al., and Pittelkow et al. Fail To Teach Or Suggest All The Elements Of Appellants' Claims 3 and 4

Claim 3 depends from claim 1. Claim 4 depends from claim 3. Under 35 U.S.C. § 112, fourth paragraph, "a claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers." "If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious." MPEP 2143.03; *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed.Cir. 1988). Because claim 1 is patentable over the teachings of Lisiecki et al., Ravi et al., and Pittelkow et al., Appellants respectfully submit that claims 3 and 4 are also patentable over the teachings of Lisiecki et al., Ravi et al., and Pittelkow et al.

In addition, the separate patentability of claims 3 and 4 is worthy or note. In addition to reciting the elements of claim 1, claim further recites wherein the second virtual tape server comprises one or more virtual host devices having a second adjustable aggregate bandwidth further comprising the step of operative if the age of the queued copy job is greater than the age threshold, decreasing the second adjustable aggregate bandwidth.

Neither Lisiecki et al., nor Ravi et al., nor Pittelkow et al., singly or in combination, teach decreasing a bandwidth for virtual host devices disposed in a first virtual tape server, and decreasing a bandwidth for virtual host devices disposed in a second virtual tape server, in response to determining that the age of a queued copy job is greater than an age threshold as recited in Appellants' claims 3 and 4. This being the case, Appellants respectfully submit that claims 3 and 4 are patentable over the teachings of Lisiecki et al., Ravi et al., and Pittelkow et

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al.

D. The Combined Teachings Of Lisiecki et al, Ravi et al., and Pittelkow et al. Fail To Teach Or Suggest All The Elements Of Appellants' Claims 10-13

Claims 10-13 depend from claim 9. Under 35 U.S.C. § 112, fourth paragraph, "a claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers." "If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious." MPEP 2143.03; *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed.Cir. 1988). Because claim 1 is patentable over the teachings of Lisiecki et al., Ravi et al., and Pittelkow et al., Appellants respectfully submit that claims 10-15 are also patentable over the teachings of Lisiecki et al., Ravi et al., and Pittelkow et al.

E. The Combined Teachings Of Lisiecki et al, Ravi et al., and Pittelkow et al. Fail To Teach Or Suggest All The Elements Of Appellants' Claims 20-21

Claims 20-21 depend from claim 19. Under 35 U.S.C. § 112, fourth paragraph, "a claim in dependent form shall be construed to incorporate by reference all the limitations of he claim to which it refers." "If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious." MPEP 2143.03; *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed.Cir. 1988). Because claim 1 is patentable over the teachings of Lisiecki et al., Ravi et al., and Pittelkow et al., Appellants respectfully submit that claims 10-15 are also patentable over the teachings of Lisiecki et al., Ravi et al., and Pittelkow et al.

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CONCLUSION

In view of the foregoing, Appellants respectfully request that the Examiner's rejection

of the subject application be reversed in all respects.

Respectfully submitted,

/Dale F. Regelman/

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/Reena Mendez/	March 17, 2009
Signature	Date of Signature

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1.   A method to write information to two virtual tape servers, comprising the steps of:

supplying a data storage and retrieval system comprising a host computer, a first virtual tape controller comprising a VTC Copy Queue, a second virtual tape controller, a first virtual tape server, and a second virtual tape server, wherein said first virtual tape controller comprises a first virtual host device and a first virtual copy device, and wherein said second virtual tape controller comprises a second virtual host device and a second virtual copy device, and wherein said first virtual tape server comprises a third virtual host device and a third virtual copy device, and wherein said second virtual tape server comprises a fourth virtual host device and a fourth virtual copy device, wherein said host computer communicates with said first virtual tape server using a host / VTS bandwidth, wherein said host computer communicates with said second virtual tape server via said second virtual host device and said fourth virtual host device, and wherein said first virtual tape server communicates with said second virtual tape server using a VTS / VTS bandwidth;

writing a host computer file to said second virtual host device disposed in said first virtual tape server;

queuing a copy job in said VTC Copy Queue, wherein said copy job comprises copying said host computer file to said second virtual tape server;

determining an age of said queued copy job;

setting an age threshold;

determining if the age of said queued copy job is greater than said age threshold;

operative if the age of said queued copy job is greater than said age threshold, decreasing said host / VTS bandwidth thereby increasing said VTS / VTS bandwidth.

2. The method of claim 1, further comprising the step of operative if the age of said queued copy job is not greater than said age threshold, restoring said host / VTS bandwidth to a pre-determined nominal value.

3. The method of claim 1, wherein said second virtual tape server comprises one or more virtual host devices having a second adjustable aggregate bandwidth further comprising the step of operative if the age of said queued copy job is greater than said age threshold, decreasing said second adjustable aggregate bandwidth.

4. The method of claim 3, further comprising the step of operative if the age of said queued copy job is not greater than said age threshold, restoring said second adjustable aggregate bandwidth to a pre-determined nominal value.

5. Canceled.

6. The method of claim 1, further comprising the steps of:

retrieving by said virtual copy controller said copy job from said copy queue;

writing said host computer file to a virtual copy device disposed in said second virtual tape server.

7. The method of claim 6, further comprising the steps of:

setting a status signal time interval;

providing a status signal from said virtual tape controller to said first virtual tape server and to said second virtual tape server at said status signal time interval.

8. The method of claim 1, further comprising the steps of:

queuing a plurality of copy jobs in said copy queue;

determining the age for each of said queued copy jobs;

providing a status signal comprising the age of the oldest queued copy job;

determining if the age of the oldest queued copy job exceeds said age threshold;

operative if the age of the oldest queued copy job is greater than said age threshold, decreasing said host / VTS bandwidth and said second adjustable aggregate bandwidth;

operative if the age of the oldest queued copy job is not greater than said age threshold, restoring said host / VTS bandwidth and said second adjustable aggregate bandwidth to a pre-determined nominal value.

9. A first virtual tape server comprising one or more virtual devices having an adjustable aggregate bandwidth, and a computer readable medium having computer readable program code disposed therein to write information to two virtual tape servers, wherein said article of manufacture is disposed in a data storage and retrieval system comprising a host computer, a first virtual tape controller comprising a VTC Copy Queue, a second virtual tape controller, said first virtual tape server, and a second virtual tape server, wherein said first virtual tape controller comprises a first virtual host device and a first virtual copy device, and wherein said second virtual tape controller comprises a second virtual host device and a second virtual copy device, and wherein said first virtual tape server comprises a third virtual host device and a third virtual copy device, and wherein said second virtual tape server comprises a fourth virtual host device and a fourth virtual copy device, wherein said host computer communicates with said first virtual tape server via said first virtual host device and said third virtual host device using a host / VTS bandwidth, wherein said host computer communicates with said second

virtual tape server via said second virtual host device and said fourth virtual host device, and wherein said first virtual tape server communicates with said second virtual tape server via said first virtual copy device, said second virtual copy device, and said fourth virtual copy device, using a VTS / VTS bandwidth, the computer readable program code comprising a series of computer readable program steps to effect:

receiving a host computer file via said second virtual host device;

receiving a signal from said first virtual tape controller, wherein said signal comprises the age of a copy job queued in said virtual tape controller, wherein said copy job comprises copying said host computer file to said second virtual tape server;

retrieving a pre-determined age threshold;

determining if said age of said queued copy job is greater than said age threshold;

operative if said age of said queued copy job is greater than said age threshold, decreasing said host / VTS bandwidth thereby increasing said VTS / VTS bandwidth.

10.   The first virtual tape server of claim 9, said computer readable program code further comprising a series of computer readable program steps to effect restoring said host / VTS bandwidth to a pre-determined nominal value if said age of said queued copy job is not greater than said age threshold.

11.   The first virtual tape server of claim 9, said computer readable program code further comprising a series of computer readable program steps to effect providing said host computer file to said second virtual tape server.

12.   The first virtual tape server of claim 11, said computer readable program code further comprising a series of computer readable program steps to effect receiving a signal from said virtual tape controller that said host computer file was written to said

second virtual tape server.

13.   The first virtual tape server of claim 9, said computer readable program code further comprising a series of computer readable program steps to effect:

receiving a status signal from said first virtual tape controller, wherein said status signal comprises a timestamp and the age of the oldest queued copy job at said timestamp.

14.   Canceled.

15.   Canceled.

16.   Canceled.

17.   Canceled.

18.   Canceled.

19.   A data storage and retrieval system, comprising a host computer, a first virtual tape controller comprising a VTC Copy Queue, a second virtual tape controller, a first virtual tape server comprising a first adjustable aggregate bandwidth, and a second virtual tape server, wherein said first virtual tape controller comprises a first virtual host device and a first virtual copy device, and wherein said second virtual tape controller comprises a second virtual host device and a second virtual copy device, and wherein said first virtual tape server comprises a third virtual host device and a third virtual copy device, and wherein said second virtual tape server comprises a fourth virtual host device and a fourth virtual copy device, wherein said host computer communicates with said first virtual tape server via said first virtual host device and said third virtual host device using a host / VTS bandwidth, wherein said host computer communicates with said second virtual tape server via said second virtual host device and said fourth virtual host

device, and wherein said first virtual tape server communicates with said second virtual tape server via said first virtual copy device, said second virtual copy device, and said fourth virtual copy device, and wherein said first virtual tape server provides information to, and receives information from said second virtual tape server using a VTS / VTS bandwidth, using the following steps:

receiving a host computer file via said second virtual host device;

receiving a signal from said first virtual tape controller, wherein said signal comprises the age of a copy job queued in said virtual tape controller, wherein said copy job comprises copying said host computer file to said second virtual tape server;

retrieving a pre-determined age threshold;

determining if the age of said queued copy job is greater than said age threshold;

operative if the age of said queued copy job is greater than said age threshold, decreasing said host / VTS bandwidth thereby increasing said VTS / VTS bandwidth.

20. The data storage and retrieval system of claim 19, wherein said virtual copy controller provides information to said second virtual tape server using the steps of:

providing said host computer file to said second virtual tape server.

21. The data storage and retrieval system of claim 20, wherein said second virtual tape server comprises one or more second virtual host devices having a second adjustable aggregate bandwidth, wherein said second virtual tape server communicates with said one or more host computers using said one or more second virtual host devices, wherein said second virtual tape server receives information from said first virtual tape server using the steps of:

operative if the age of said queued copy job is greater than said age threshold,

decreasing said second adjustable aggregate bandwidth; and

operative if the age of said queued copy job is not greater than said age threshold, restoring said second adjustable aggregate bandwidth to a pre-determined nominal value.

EVIDENCE APPENDIX B

NONE

RELATED PROCEEDINGS APPENDIX C

NONE